DISA Test, Evaluation, and Certification: A New Organizational Construct

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Test, evaluation, and certification (TE&C) is an essential part of the Department of Defense (DOD) acquisition system. As the DOD moves forward with the implementation of a new acquisition process for information technologies, the Defense Information Systems Agency (DISA) must lead from the front. The DISA TE&C organizations bring tremendous expertise across all information technology (IT) TE&C disciplines: developmental testing, operational testing, joint interoperability test and certification, and security testing or information assurance certification. However, we must evolve beyond our traditional methodologies to provide the same rigorous services in the agile IT environment. This article describes the new DISA test and evaluation organizational structure and the goals that we have established to responsive, mission-focused TE&C services that enable rapid acquisition of enhanced information technologies for the warfighter.

Key words: Test, evaluation, and certification; joint interoperability; DISA organization and goals; agile testing; virtualization; test automation; TestForge.mil.

The Defense Information Systems Agency (DISA) is committed to advancing the art and science of test, evaluation, and certification (TE&C) of information technology (IT) and national security systems (NSSs). The DISA TE&C mission is to provide responsive, agile, and cost-effective interoperability; other tests, evaluations, and certifications; or both to support rapid acquisition and fielding of enhanced net-centric warfighting capabilities.

Clearly, TE&C is an essential element of the Department of Defense (DOD) acquisition system. As the DOD moves forward with agile IT acquisition concepts, DISA must be at the forefront of shaping the supporting policies, processes, and joint TE&C environment. DISA TE&C organizations must progress toward the use of distributed test methodologies that provide realism and promote joint mission effectiveness. DISA's early and continuous involvement throughout the IT acquisition life cycle with service proponents, operational sponsors, and industry developers will help ensure that agility is achieved.

DISA TE&C organization

DISA recently restructured its testing organization. The new structure better aligns test and certification activities with the agency's strategic objectives. DISA TE&C organizational elements are aligned under the DISA's test and evaluation (T&E) executive, and include the Office of the Test and Evaluation Executive (TEO), Joint Interoperability Test Command (JITC), and the Test and Evaluation Management Center (TEMC). DISA TE&C organizations and facilities are located in Fort Huachuca, Arizona; Indian Head, Maryland; and Falls Church, Virginia. The Falls Church organization and testing labs will move to Fort Meade, Maryland, in April 2011, as part of the Base Realignment and Closure. *Figure 1* depicts the overarching DISA TE&C organizational structure.

Collectively, DISA TE&C organizations and associated facilities serve as the IT test bed in the Major Range and Test Facility Base (MRTFB) and provide capabilities and infrastructure for end-to-end system engineering and execution of distributed, net-centric testing of core technologies and mission-enabling applications supporting the joint warfighter. The DISA MRTFB is a national asset that provides full spectrum TE&C services in support of DOD, other government agencies, and industry.

The DISA T&E executive provides oversight of all DISA T&E activities. The TEO is responsible for serving in advisory and support roles within various Office of the Secretary of Defense, DISA, and joint governance groups (*Figure 2*). The TEO influences

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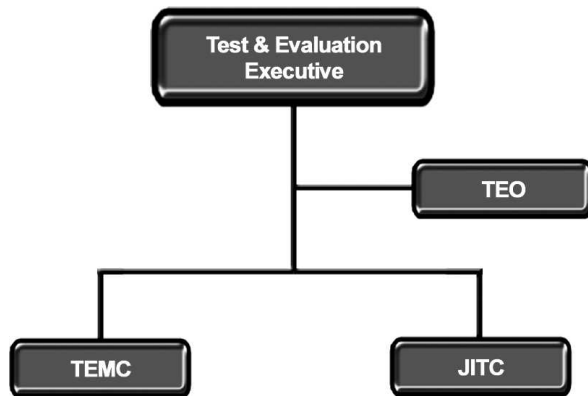| 16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
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Figure 1. Defense Information Systems Agency Test, Evaluation, and Certification organizational structure.

DOD IT TE&C strategies, policies, procedures, and investments. The TEO organizational structure consists of the deputy T&E executive, administrative staff, and an advisory staff. The Interoperability Policy and Certification Panel (IP/ICP) lead serves as DISA's voting member on the Military Communications and Electronics Board IP/ICP and represents the DISA T&E executive at various senior-level Office of the Secretary of Defense T&E working groups and advisory boards. The Joint Test & Evaluation Methodology Transition director works in cooperation with the operational T&E director to improve the ability to conduct testing in a joint environment and validates the capability test methodology to define and use a distributed, live, virtual, constructive test environment to evaluate joint mission effectiveness. The Joint Test & Evaluation (JT&E) liaison supports the JT&E Program and serves as a conduit to DISA for all chartered and proposed JT&E efforts and quick reaction tests. Lastly, the strategic planning and communications chief serves as the principal adviser for defining organizational planning and outreach strategies associated with all TE&C elements within DISA.

Joint interoperability test command

As designated by the Joint Chiefs of Staff, JITC certifies IT and NSS interoperability and net-readiness for joint military operations (*Figure 3*). In addition to

serving as an operational test agency, JITC serves as the responsible test organization for various DOD program offices. JITC works closely with the warfighting combatant commanders during exercises and contingency operations, providing them on-the-spot evaluations of problem areas and viable mission-oriented solutions. The laboratories at JITC operate as an MRTFB. JITC's global reach extends to the entire spectrum of DOD, federal government, private industry, and allies in support of command and control, intelligence, and defense reform initiatives. JITC deals directly with vendors to provide critical preacquisition test results. This early involvement in development results in better systems at lower cost.

JITC's mission is supported by a blend of military, civilian, and contractor personnel, including engineers, computer scientists, and technical and operational experts. JITC government personnel provide technical direction, policy decisions, schedules, and program cost controls in the management of JITC daily operations. The organization is primarily composed of divisions and portfolios and is aligned with the warfighting mission areas to provide consistent practices and processes across the testing disciplines (developmental, operational, interoperability, and security) and support the implementation of a risk-based test strategy that enables agile testing and rapid fielding. Divisions offer business and internal services to JITC to perform its mission, and the portfolios execute the JITC mission and address customer requirements. JITC elements are as follows:

- The *Operational Test & Evaluation Division* conducts operational testing of IT and NSSs acquired by DISA and other DOD organizations to ensure capabilities are effective, suitable, interoperable, and secure. This division assists in the preparation of critical operational issues and develops, defines, and publishes measures of effectiveness, measures of suitability, and measures of performance. It also directs and approves operational T&E methods for data collection, reduction, and analysis.
- The *Business Management Division* provides management and oversight of all JITC business,
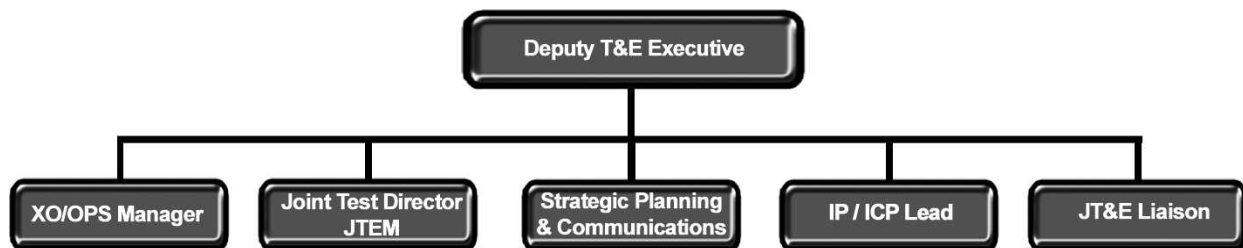

Figure 2. Office of the Test and Evaluation Executive organizational structure.

Figure 3. Joint Interoperability Test Command organizational structure.

personnel, training, contracts, and security oper-ations in support of JITC's mission, goals, and objectives while obtaining or providing best-value goods and services for JITC's workforce. This includes command support activities, corporate-level management of proposals, and contracts or agreements. This division also serves as the MRTFB focal point.

- The *Warfighter Support Division* assists the JITC commander with setting command priorities and moderating the operational tempo in support of day-to-day command operations. It provides exercise and contingency support to the warfight-er and combatant commander by participation in combatant commander exercises, deploying to contingencies, and providing a 24/7 technical support hotline.

- The *Strategic Planning & Engineering Division* provides leading edge test engineering, instru-mentation, and operations services to the JITC divisions and portfolios in support of the overall JITC mission. This support includes defining and coordinating the integration of test engineering best practices, oversight of key acquisition test programs, and establishing standard practices for instrumentation development.

- The *Test Bed Operations*, *Network & Infrastructure Division* plans for and maintains functional test beds, local and wide area networks, and labora-

tories at JITC. It provides timely facilities infrastructure and logistics support services reso-lution to JITC's test portfolios and divisions.

- The *Enterprise Services Portfolio* supports the fielding of global net-centric solutions by pro-viding continuous and effective T&E services to DISA and DOD joint acquisition programs within the enterprise services construct.

- The *Focused Logistics and Business Portfolio* serves as the focused logistics and business mission area responsible test organization for the DOD and other federal agencies. It also assists programs in the transition to a capability-based net-centric environment.

- The *Force Application or Force Protection Portfolio* conducts interoperability assessments, standards conformance, and interoperability certification testing of force application or protection systems and joint tactical data links in hardware-in-the-loop and operationally realistic environments to validate the implementation of approved stan-dards and certify system interoperability in a joint environment.

- The *Command and Control (C2) and Battlespace Awareness (BA) Portfolio* mitigates risk to C2 and BA community programs and activities by providing developmental and interoperability T&E support and certification services with the goal of enhancing C2 and BA systems capabilities
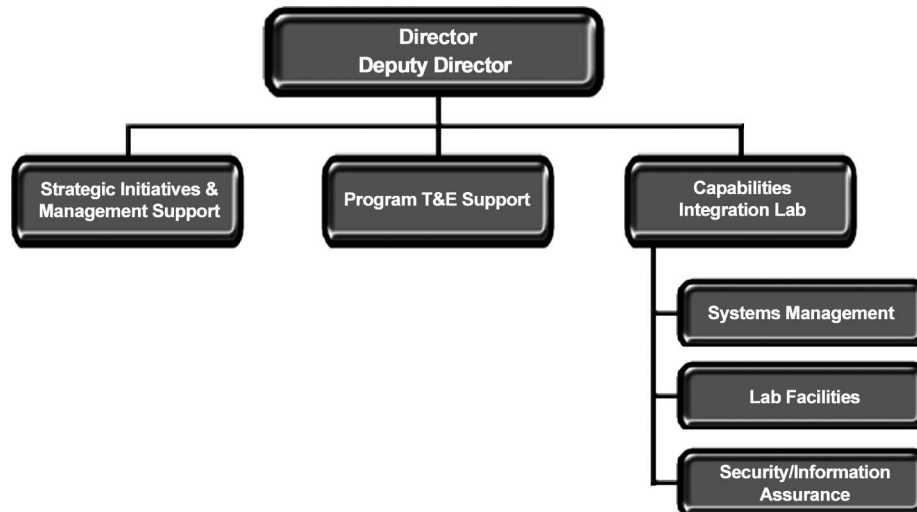
Figure 4. Test and Evaluation Management Center organizational structure.

and performance in support of joint and coalition warfighters.

- The *Battlespace Communications Portfolio* supports the warfighter with direct technical assistance and through testing of secure and nonsecure voice, video, and data communications. It characterizes performance and mitigates risk as net-centric transport solutions are introduced to the global information grid.

- The *National Intelligence Portfolio* mitigates risk to national intelligence community programs and activities by providing support through developmental and interoperability T&E and certification efforts to enhance national collection or dissemination systems capabilities and performance.

- The *Homeland Security or Information Assurance Portfolio* provides the full range of testing services, technical support, coordination, and oversight to the DOD, Department of Homeland Security, and other federal, state, and local agencies to ensure seamless acquisition, integration, and Information Assurance (IA) of systems supporting the DOD and the National Command Authority.

Test and Evaluation Management Center

The TEMC is a staff organization responsible for strategic management of agency test resources. TEMC provides TE&C oversight and guidance to DISA acquisition programs to ensure consistent application of sound T&E methodologies and processes. TEMC has highly skilled and motivated computer scientists, electrical engineers, operations research analysts, IT specialists, and management analysts who establish, review, and enforce TE&C strategies, policies, and procedures for DISA acquisition programs. They

represent DISA, as well as champion strategies within the TE&C community.

The TEMC Strategic Initiatives & Management Support Branch is responsible for TEMC resource management in the areas of personnel, finance, and contracting and supports the daily operations mission by executing all aspects of logistics, training, facilities, security, base realignment and closure management, and internal controls. The Program T&E Support Branch provides guidance in the implementation of agile T&E strategies and methodologies and supports the DISA campaign plan by formalizing procedures to provide TE&C services to the DISA development community at large and assist in planning test events necessary to provide the information and confidence that DISA program capabilities are ready for implementation. The Capabilities Integration Lab Division operates and maintains the DISA test infrastructure, providing on-demand test suites, operational network connectivity, collaborative environment, multiple security levels, and technical support services. It works to ensure program system integration through implementation of seamless integration of software capabilities within required security framework and leveraging operational network infrastructure (*Figure 4*).

The TEMC laboratory is also an element of the MRTFB. With DISA laboratories scheduled to move to Fort Meade beginning in 2011, the TEMC is dedicated to making the relocation as transparent as possible by minimizing disruption to services and programs.

DISA campaign plan

In January 2010, Lieutenant General Carroll F. Pollett (DISA director) formally established a cam-

paign plan to focus on the nation's need for a force that is ready and capable of performing the full range of military operations. The DISA campaign plan defines the major focus areas and goals that will enable DISA to meet the demands of the warfighter. The campaign plan is centered on "lines of operation" and supported by "joint enablers" that provide the framework for strategic planning, budgeting, and task prioritization or execution. The plan lays out the methods by which DISA will satisfy its goals and achieve its objectives.

Within the campaign plan, the three lines of operation are as follows:

- enterprise infrastructure,
- C2 and information sharing,
- operate and assure.

The joint enablers are the process and governance areas that support the lines of operation. The nine joint enablers are as follows:

- acquisition,
- contracting,
- engineering,
- information and knowledge management,
- people,
- planning,
- resources,
- spectrum,
- testing.

The DISA TE&C strategic plan coincides with the overarching DISA campaign plan joint enabler for testing, which outlines the priorities in clearly stated 2- and 4-year actions for accomplishing the TE&C mission.

DISA TE&C objectives and goals

The primary DISA TE&C objectives are as follows:

- ensuring mission-focused agility through rapid development of mission-oriented test plans that permit objective assessments of technical and operational capabilities and limitations;
- improving TE&C by ensuring integration and synchronization of efforts among proponents, operational sponsors, developers, and testers;
- ensuring use of consistent, sound, repeatable TE&C strategies that can be executed at all levels, by any test organization, and that, when executed, yield similar results.

Early program involvement and enhanced methods or processes for executing TE&C will lead to rapid deployment of IT and NSS capabilities that are operationally effective, suitable, interoperable, and secure. To improve TE&C processes, DISA has established three aggressive goals:

1. provide efficient, responsive joint interoperability TE&C and other capabilities as a service;
2. establish an on-demand TE&C environment that provides enhanced virtualization and access to federated capabilities that serve the TE&C community;
3. develop and retain a highly qualified and professional workforce to ensure the success of agile TE&C activities.

To achieve these goals and objectives, we must introduce new strategies that allow us to adapt to rapidly changing technologies, ensure that we stay engaged with the program offices to help them find and fix problems early, stay objective in our assessments, and make the right investment decisions to keep us relevant in the on-demand world of IT. Strategies for satisfying DISA TE&C goals include the following:

- enhance the execution of the IT and NSS TE&C mission in accordance with DOD policy and federal law;
- enhance the execution of DISA's operational test mission;
- reduce TE&C timelines in support of agile acquisition through implementation of the capability TE&C model;
- enhance the ability to execute security (IA) TE&C;
- work with capability portfolio managers to ensure a system of system testing in a joint operational context;
- implement a network pilot that supports development, integration, and TE&C;
- improve infrastructure and federate capabilities across DOD;
- implement a virtual environment in support of TE&C;
- maintain a focus on recruiting, hiring, and retaining a workforce of trained, experienced TE&C professionals.

Tasks and initiatives associated with respective DISA TE&C strategies are assigned and tracked for accomplishment to verify whether goals have been met and objectives have been satisfied within established timelines. Several key initiatives will allow DISA to satisfy their strategic TE&C goals and objectives.

For example, DISA TE&C organizations will support IT acquisition reform in accordance with National Defense Authorization Act Section 804 by establishing new test approaches that merge TE&C

events (i.e., development testing, operational testing, net-ready key performance parameter validation, and IA) more concurrently.

Initiatives

DISA currently provides a software development environment known as Forge.mil (see www.forge.mil).

For TE&C, we envision TestForge.mil as a virtual environment that enables developers, users, and testers to rapidly verify new software that satisfies user needs. The environment promotes collaboration among key stakeholders, synchronization of development and testing, and integration of team members, and combined execution to satisfy the decision-making needs of all test customers. TestForge provides on-demand access to testing capabilities throughout the development life cycle and enables capabilities that support continuous integration and service virtualization. TestForge currently provides support for testing within the development cycle on agile projects. This includes support for defect management, automated unit, functional and regression testing, and static code analysis through a continuous integration environment. In the near future, TestForge will provide full support for all testing activities including performance, scalability, reliability, interoperability, operational, net-ready key performance parameters, and IA. TestForge will be a key element of an enterprise test and integration capability that provides access to common tools, methodologies, and support.

The IA Range is an infrastructural platform designed to integrate distributed and heterogeneous IA architectural systems and solutions and the DOD Computer Network Defense (CND) operational hierarchy to provide DOD stakeholders with a venue to strengthen the global information grid security posture by supporting operational exercises, training network defenders, and testing and evaluating new cyber capabilities. DISA Field Security Operations manages the IA Range and ensures that it provides a realistic Internet environment and tools in which to test application security, as well as train personnel in computer network operations. Field Security Operations intends for the IA Range to allow for network services found at the NetOps tiers 1–3 and provide a joint service environment for cyber exercises and CND AP training. In support of its DISA TE&C mission, the IA Range incorporates in-depth defense design principles to provide DOD organizations with a

methodical, repeatable, and verifiable cyber T&E framework (supported by performance-based metrics indicators) designed to measure (quantify and qualify) the capabilities and limitations of network defenders to synergistically integrate *people*, *operations*, and *technology* to *protect*, *monitor*, *detect*, *analyze* and *diagnose*, and *respond* (contain, eradicate, and recover) to cyber security attacks. DISA TE&C facilities will use the IA Range to promote a consistent, repeatable, and verifiable T&E venue by which IA and CND technical and operational concepts will be validated against requirements and specifications for improvement.

To further professionalize the DISA TE&C workforce, the DISA T&E executive sponsors several events and efforts. The DISA T&E forums are quarterly professional development events and are open to all DISA acquisition professionals and contractors and to guests. The T&E forums have featured nationally recognized speakers from the testing community. The bimonthly T&E management symposiums focus on specific issues related to DOD test processes, procedures, and methodologies.

Conclusion

DISA TE&C organizations are well prepared to conduct mission-focused and agile testing across all IT portfolios, and they strive to continuously improve efficiency through use of virtualization, enhanced test automation, collaboration, and federation across DOD's overall distributed joint test infrastructure. Through conscious investment decisions, sensible allocation of resources, and new, innovative strategies, DISA TE&C organizations will enable rapid acquisition of enhanced capabilities for the warfighter. ❏

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